

**RESEARCH SUPPORTING SOUND DECISIONS**



**2015  
2016  
PROGRESS  
REPORTS**

# Joint Fire Science Program Governing Board



The Joint Fire Science Program (JFSP) is jointly funded by the Departments of Agriculture and the Interior, and governance is through a 12-member Governing Board with 6 members from the U.S. Forest Service (USFS)

and 1 member each from the Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), U.S. Fish and Wildlife Service (USFWS), National Park Service (NPS), U.S. Geological Survey (USGS), and Office of Wildland Fire.

**Bil Grauel**  
Bureau of Indian Affairs

**Karen Prentice, Vice Chair**  
Bureau of Land Management

**Paul Steblein**  
Office of Wildland Fire

**Rob Griffith**  
U.S. Forest Service

**Elizabeth Reinhardt**  
U.S. Forest Service

**Borys Tkacz**  
U.S. Forest Service

**Jim Menakis**  
U.S. Forest Service

**Matt Rollins, Chair**  
U.S. Forest Service

**Robin Wills**  
National Park Service

**Sue Phillips**  
U.S. Geological Survey

**Marie-Louise Smith**  
U.S. Forest Service

**Bert Plante**  
U.S. Fish and Wildlife Service



Joint Fire Science Program Governing Board (from left to right): John Cissel, Karen Prentice, Rob Griffith, Paul Steblein, Borys Tkacz, Matt Rollins, Jim Menakis, Bil Grauel, Bert Plante, and Robin Wills. Not pictured: Elizabeth Reinhardt, Marie-Louise Smith, and Sue Phillips.

Photo courtesy Karen Prentice

# Science in Support of Secretarial Order 3336 Rangeland Fire Prevention, Management, and Restoration

In May 2015, the Rangeland Fire Task Force published “An Integrated Rangeland Fire Management Strategy” in response to Department of the Interior Secretarial Order 3336. In this report, action item #4 under Science and Research states the need to “Develop or identify a primary online science delivery system to allow easier access to published science products and other science information.” Primary responsibility of this task was assigned to the JFSP-funded Great Basin Fire Science Exchange.

The Great Basin Fire Science Exchange has expanded its role, building on current and previous research, to be the primary delivery system of science information for the management and science communities in the Great Basin. In this role, the exchange:

- Compiles relevant scientific information; identifies gaps in archived information; updates and maintains existing websites; provides active links (e.g., Great Basin

Landscape Conservation Cooperative, Great Basin Research and Management Partnership) to facilitate transfer of relevant scientific information; and develops science syntheses, tools, and services (e.g., training) to increase understanding and use of science in management decisions.

- Developed the “Science Support Center” website in regard to Secretarial Order 3336 to support collaboration between the science and fire management communities. The purpose of the website is to improve the effectiveness of fire prevention, suppression, and restoration efforts in the Great Basin. Visit the website at <http://greatbasinfirescience.org/secretarial-order-3336/>.

In addition to many other ongoing research efforts, Table 1 highlights research funded by the JFSP in 2015 related to rangeland fire prevention, management, and restoration.

***Our mission at the Great Basin Fire Science Exchange is to provide access to scientific information that meets the needs of sagebrush ecosystem management. Because of our mission focus, this website serves as the Science Support Center for Secretarial Order 3336.***



**Table 1.** New research funded by the JFSP in 2015 related to rangeland fire prevention, management, and restoration.

Project ID	Title
15-1-03-6	Relations among cheatgrass-driven fire, climate, and sensitive-status birds across the Great Basin
15-1-03-23	Modeling long-term effects of fuel treatments on fuel loads and fire regimes in the Great Basin
15-1-07-2	Long-term SUCCESS: SUCcession and Ecosystem dynamics in the Sagebrush Steppe following wildfires
15-1-07-30	Lick Creek Demonstration-Research Forest: 25-Year Fire and Cutting Effects on Vegetation and Fuels
15-1-07-39	Vegetation succession in post-fire seeding treatments

# Joint Fire Science Lines of Work



Photo Courtesy BLM NIFC

## What is a line of work?

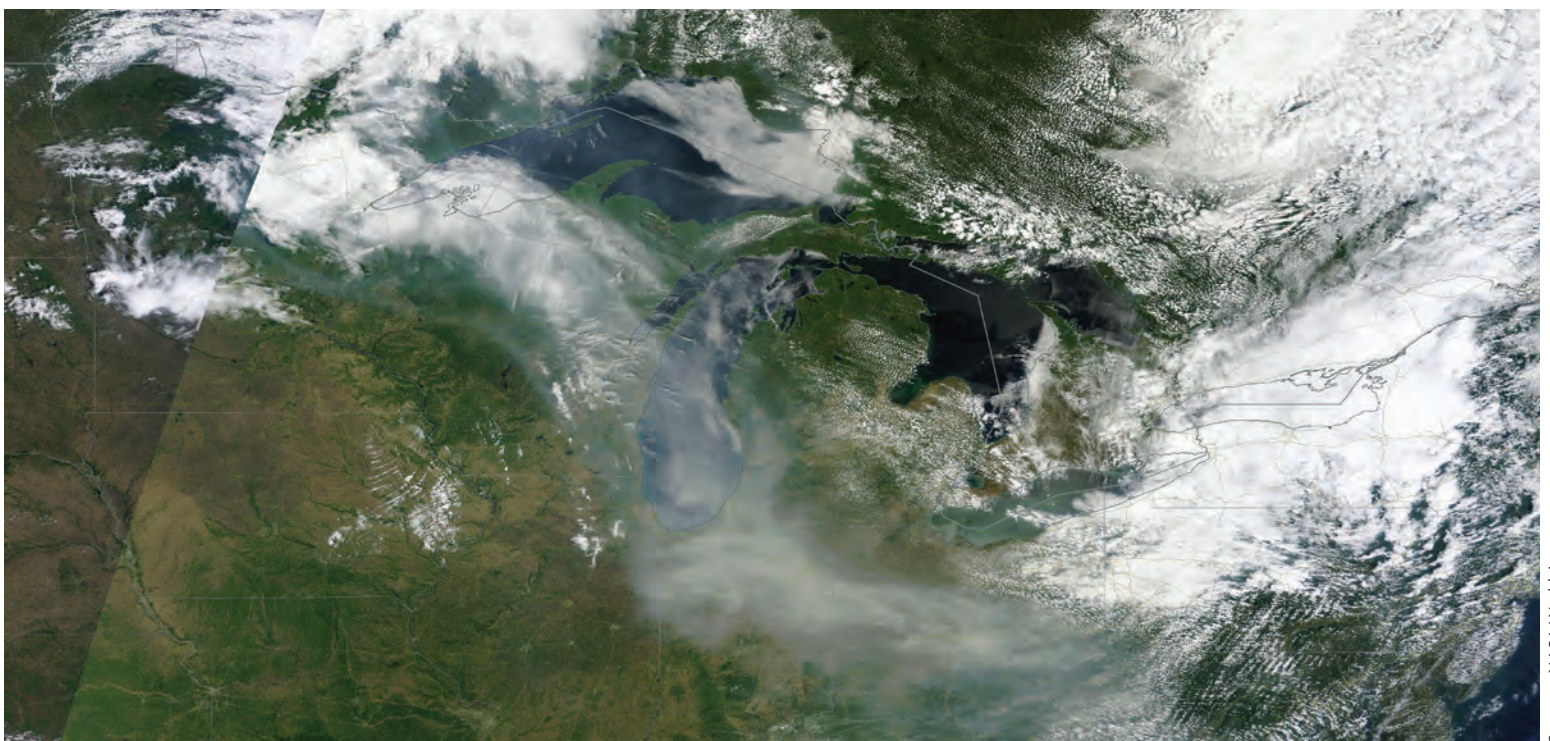
Lines of work address complex management problems and require a coordinated multiyear approach to develop integrated solutions useful to fire and fuel managers. Lines of work are intended to guide JFSP investments over a period of 3-5 or more years. The JFSP currently has two lines of work: (1) smoke and air quality and (2) fuel treatment effectiveness.

## What are the criteria for lines of work?

- The topic is of high priority to the fire and fuels management community and is within the JFSP mission.
  - The issue is enduring so that results obtained over the course of 3-10 years will be relevant.
  - Research questions have sufficient complexity that require a focused, long-term approach involving a sequence of research.
- The topic has the need and potential to build towards a significant deliverable to improve management effectiveness.

## How do we implement a line of work?

- Problem framing, potentially through roundtables.
- Science planning.
- Proposal solicitation and funding.
- Communication plan development and implementation.
- Monitoring and adjustment; check back with roundtables.



Courtesy NASA Worldview

Smoke from wildfires in Canada drift over the Midwestern U.S. in June 2015.

# FASMEE – Fire and Smoke Model Evaluation Experiment

The objective of the Fire and Smoke Model Evaluation Experiment (FASMEE) is to provide measurement techniques and observational data necessary to evaluate and advance operationally used fire and smoke modeling systems and their underlying scientific models.

- This is an unprecedented multidisciplinary, multiagency project to improve wildland fire and smoke models. Participants include the Department of the Interior, U.S. Forest Service, Department of Defense, National Oceanic and Atmospheric Association, National Aeronautics and Space Administration, Environmental Protection Agency, and leaders in the academic community.
- This effort builds on the work of RxCADRE and lays the groundwork for future science research. The proposed validation dataset to be collected by FASMEE has been identified as a critical need for progressing and transitioning newer models and systems into operational use.

By directly influencing the ability to model fires and smoke, FASMEE will impact:

- (1) The land management community—through improved models and guidance on their performance, reliability, scope of applicability, and validation.
- (2) The scientific community—through a unique dataset and new understanding of fire; fire effects and emissions; and smoke plumes, chemistry, and transport.
- (3) The public—through improved fire information and smoke impact warnings.

Science leads are currently developing the study plan for observational data collection, reduction and analysis, data management, and initial model evaluation.

## *FASMEE Principal*

### *Investigators:*

Roger Ottmar,  
Principal Investigator,  
U.S. Forest Service,  
rottmar@fs.fed.us

Tim Brown,  
Co-Principal Investigator,  
Desert Research Institute,  
tbrown@dri.edu

Sim Larkin,  
Co-Principal Investigator,  
U.S. Forest Service,  
larkin@fs.fed.us

Nancy French,  
Co-Principal Investigator,  
Michigan Tech  
Research Institute,  
nhfrench@mtu.edu



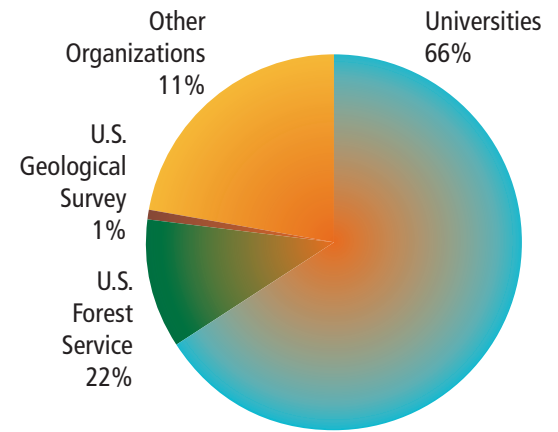
Smoke over Crater Lake National Park in September 2015.

Courtesy NASA Worldview

# Annual Research Solicitation Summary

## Managing through Innovation

In 2015, 32 research proposals were selected out of 128 submissions (25 percent) (Table 2). Figure 1 depicts the percentages of JFSP funding allocated in FY 2015 according to organization.



**Figure 1.** JFSP funding percentages by organization in 2015. Funding percentages change annually.

**Table 2.** Research topic solicitations by task number and amount funded in 2015.

Task Number	Research Topic	Proposals Received	Proposals Selected	Total Funded
15-1-01	Fuels mapping for emissions inventories	2	1	\$435,000
15-1-02	Smoke hazard warning system	4	2	\$657,113
15-1-03	Implications of changing fuels and fire regimes – selected regions	28	5	\$1,707,996
15-1-04	Fire ember production	6	3	\$1,175,000
15-1-05	Fire effects on soil heating	12	3	\$925,999
15-1-06	Fire weather and decision-making: a social and modelling analysis	13	2	\$680,000
15-1-07	Re-measurement – long-term fire effects on vegetation and fuels	27	9	\$1,957,933
15-2-01	Graduate Research Innovation (GRIN) Award	36	7	\$173,980
<b>Grand total</b>		<b>128</b>	<b>32</b>	<b>\$7,713,021</b>



The JFSP Governing Board participates in a field trip at the site of the 2013 Rim Fire to study the fire's behavior and postfire effects in June 2015. The Rim Fire is the third largest wildfire on record in California's history, and it burned 257,314 acres (402 miles<sup>2</sup>; 1,041 kilometers<sup>2</sup>). It is also the largest wildfire on record in the Sierra Nevada mountain range.



Access ongoing research at: [https://www.firescience.gov/JFSP\\_research.cfm](https://www.firescience.gov/JFSP_research.cfm)

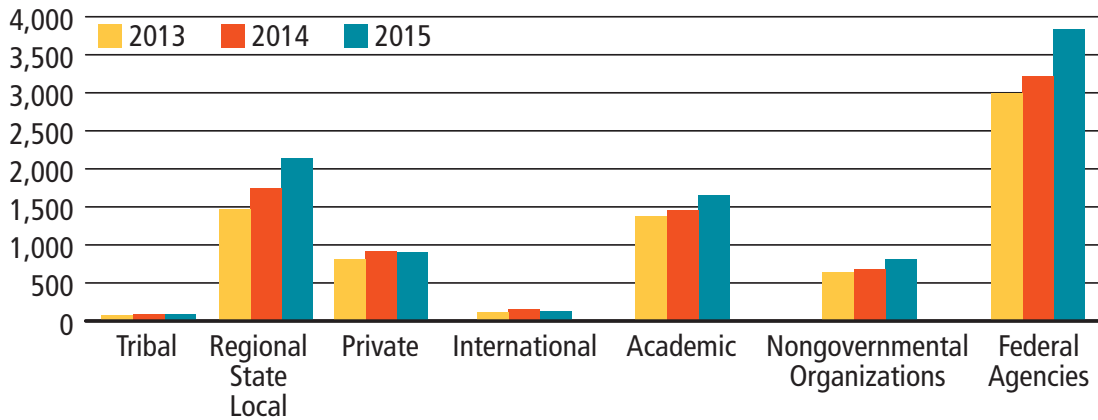
# Fire Science Exchange Network

## Vision and Goals of the JFSP “Exchanges”

The goal of the JFSP is to accelerate the awareness, understanding, and adoption of wildland fire science information by federal, tribal, state, local, and private stakeholders within ecologically similar regions, called “exchanges.” The JFSP envisions a national collaborative science delivery network.

## “By the Numbers” – 2015 Fire Science Exchange Network Milestones

Figure 2 indicates the annual numbers of participants in Fire Science Exchange Network activities, according to the participants’ organizational groups. Overall, the number of participants has steadily grown in most groups over the past 3 years, with the largest percent increase in the regional/state/local organizations and the smallest percent increase in tribal nations. Table 3 shows a year-to-year comparison of the number of participants by activity type.



**Figure 2.** Numbers of Fire Science Exchange Network participants by organizational groups (year-to-year comparison).

**Table 3.** Numbers of Fire Science Exchange Network participants by activity type (year-to-year comparison).

Activity Type	2013	2014	2015	Total
Social Media (S)	5,621	4,189	6,374	16,184
Activity/Event (A)	1,840	3,970	3,042	8,852
All Activity Types (S+A)	7,461	8,159	9,416	25,036



Photo courtesy Karen Prentice

Members of the Tallgrass Prairie and Oak Savanna Fire Science Consortium demonstrate the latest fuels treatment research to the JFSP Governing Board on a field trip in October 2015.

# A National Cluster Evaluation of the Fire Science Exchange Network's Processes and Impacts

The goal of this ongoing evaluation is to assess the processes and outcomes of the Fire Science Exchange Network's activities at the national level. Evaluation results are intended to:

- (1) Assist the JFSP Governing Board in determining how to improve and further support exchange performance and success.
- (2) Provide feedback to exchanges concerning progress toward their goals to help maximize the impacts of outreach and educational activities.
- (3) Facilitate exchange development of JFSP best practices toward reaching shared goals.

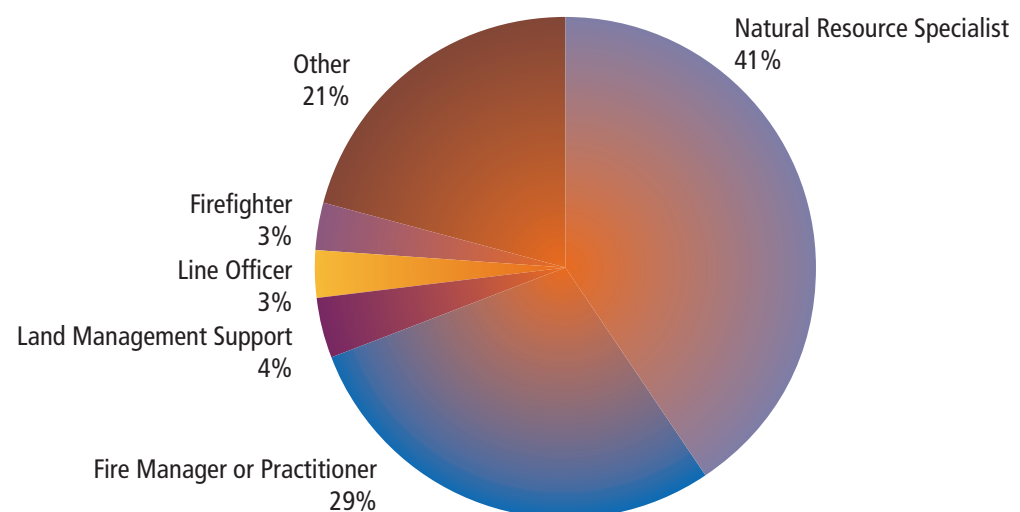
These results indicate that exchanges are enhancing perceptions of fire science and its use, increasing interactions among fire science professionals, seen as valuable additions to the fire science community, and providing valuable and easily obtained translated fire science through their websites, social media accounts, and events.

- Similar to previous years, consumers expressed the strongest agreement with the statement, *"Using fire science information enhances my effectiveness on the job."*
- As with previous evaluations, respondents indicated the highest level of agreement with the statement, *"The Exchange is needed to help coordinate sharing of fire science information in my region."*

## Results

During the past 5 years, the national evaluation online survey data indicate that the exchanges have made significant progress toward their shared goals as evidenced by improvements between responses collected early in exchange establishment and responses from exchanges in their 4th year.

Figure 3 presents the percentages of the main categories of participants in exchange activities and events. Natural resource specialists make up the largest group of exchange participants.



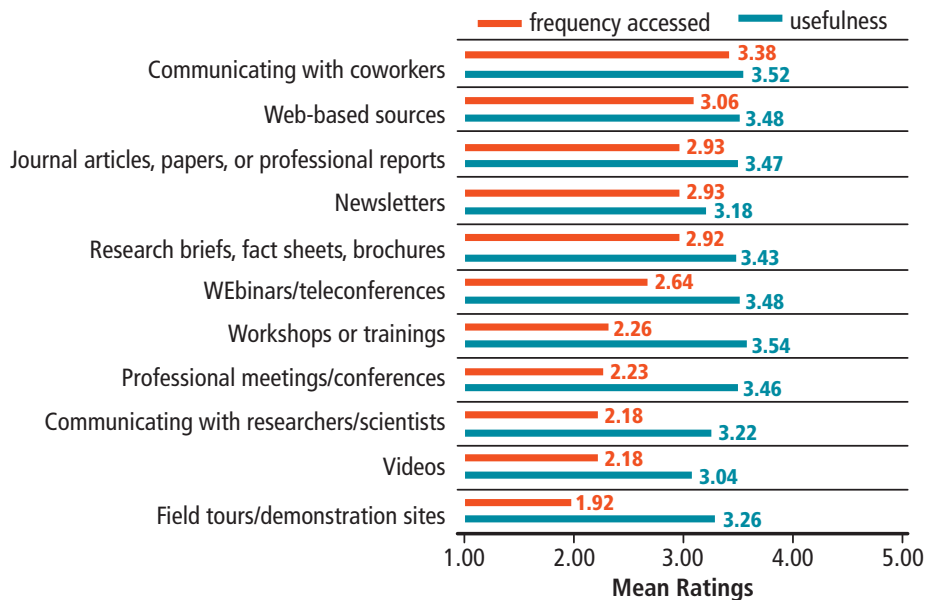
**Figure 3.** The percentages of primary roles of those who participate in exchange activities and/or events.



# Experiences with Fire Science Communication Sources

The JFSP administered an online survey to examine consumers' basic experiences with 11 common communication sources of fire science information. Consumers were first asked to indicate how often they accessed information from each source during the last year. Next, consumers were asked to rate

the usefulness of the information they had accessed from each source. According to the survey, the two most frequently accessed communication sources are coworkers and web-based sources. Whereas, the two most useful communication sources are workshops or trainings and coworkers (Figure 4).



**Figure 4.** Average ratings of consumer responses regarding access and perceived usefulness of different fire science communication sources.



Members of the Tallgrass Prairie and Oak Savanna Fire Science Consortium, JFSP office staff, and JFSP Governing Board outside the Aldo Leopold Shack in Wisconsin in October 2015.

Photo courtesy Karen Prentice

# Fire Policy and Science – An Assessment

## Assessment

**Goal: Ensure the latest scientific information is surfaced, interpreted, and integrated in a coherent fashion to inform policy decisions.**

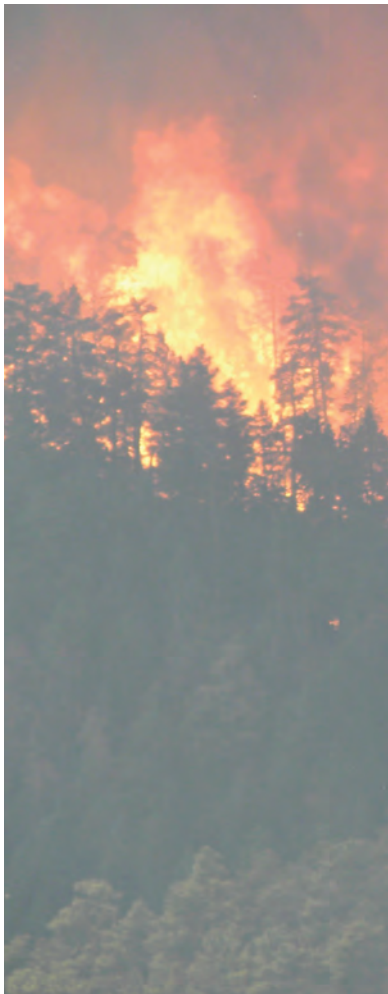
Wildland fire management involves a broad, diverse community of multiple agencies and organizations across many levels of government, including scientists, policymakers, land managers, and other stakeholders. Credible, well-considered scientific results are essential to ensure policy is well-grounded, understandable, and likely to achieve stated policy aims.

## Preliminary Assessment Results

- Policymakers rarely have time to access and use primary science. Instead, they rely on a syntheses of relevant science and, most importantly, the counsel of their trusted science network.
- A significant role for staff and consultants is to serve as facilitator and/or translator of scientific information to policymakers. We need more people who can provide this “bridge” between science and policy.
- A key use of science in the policy arena is to model the potential outcomes from a course of action and to use this information to actively manage risk.

The purposes of the fire policy and science assessment are to:

- Assess where fire policymakers are receiving scientific information.
- Identify research needs that will inform policymaking toward improved wildland fire management.
- Identify opportunities to enhance the integration of science into policy.



The 2012 High Park Fire in Colorado.



Keith Stockmann

A Burned Area Emergency Response (BAER) team assesses potential threat of debris flows to infrastructure and possible treatments following the largest fire in Los Angeles County's recorded history.

# Outcomes of Fire Research: Is Science Used?

An external program review in 2013 found that, "the JFSP should include greater emphasis on describing the value of the outcome of the program in addition to the outputs." Outputs are defined as activities and products that an organization undertakes. Outcomes are defined as the expected benefits that result from inputs and outputs.

The JFSP and other science producers have historically placed emphasis on outputs as opposed to outcomes. One reason for this is, outcomes are more difficult to evaluate than outputs. Long-term outcomes are especially difficult to evaluate because they may take decades or longer to be fully realized.

An upcoming article in the International Journal of Wildland Fire by Molly Hunter, JFSP science advisor, addresses the need to

determine if science has been used effectively to inform management and policy decisions. The article also explores factors that facilitate the use of science.

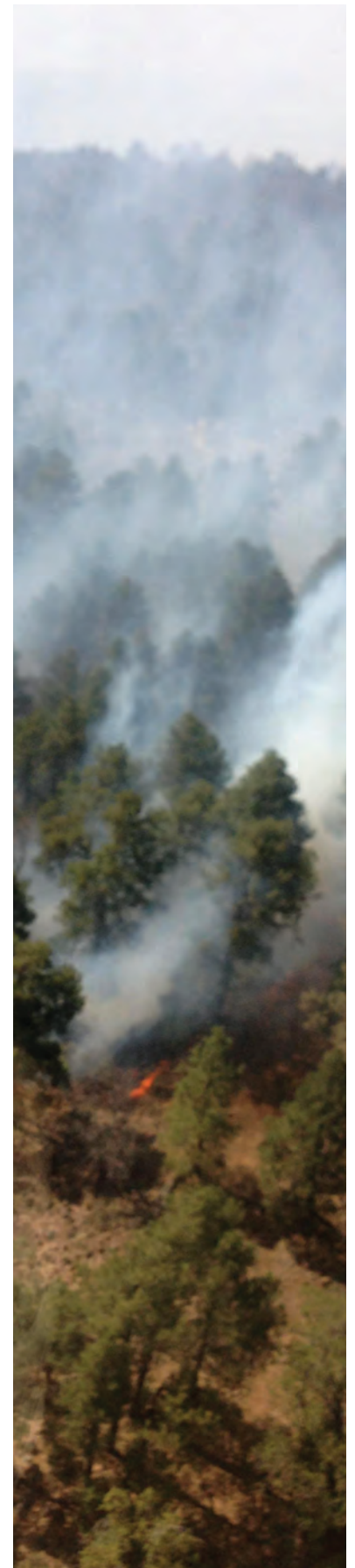
Some conclusions of the article reveal:

- Yes, managers use fire science! Considering all methods, some evidence of use was found for 44 of 48 projects.
- Fire science has resulted in learning (short term) and action (medium term).
- JFSP research is relevant to fire and fuel manager needs.
- Outreach, primarily in the form of scientist/manager/boundary spanner interaction, has facilitated application of the science.



Caty Clifton

Example of a sediment fence used to measure postburn hillslope erosion.



Skunk Fire prescribed operations in Arizona in 2014.



# JFSP Leadership Transition

**Farewell to John Cissel,  
JFSP Program Director,  
who is retiring after 9 years.**



**Welcome to John Hall,  
new JFSP Program Director,  
beginning April 2016.**

Dr. Hall comes to the JFSP from the Resource Conservation and Climate Change program area under both the Department of Defense's (DOD's) Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP).

SERDP is the DOD's environmental science and technology research program, whereas ESTCP is the DOD's environmental science and technology demonstration and validation program.

Dr. Hall has had significant experience in developing and managing large-scale natural resource planning efforts on federal lands. He also is a former member of the Board of Directors for the North America Section of the Society for Conservation Biology. He is a graduate of the U.S. Naval Academy and served as a nuclear-trained officer in the U.S. submarine force. He earned graduate degrees from Washington State University.



Rim Fire in the Sierra Nevada mountain range in 2013.

# JFSP Communication Tools

In addition to firescience.gov, the program's main website, the JFSP communicates information on current fire-related research through Fire Science Digests and Flash Friday eNews.

The JFSP published three Fire Science Digests in FY 2015 on riparian treatments, the Interagency Fuels Treatment Decision Support System, and traditional ecological knowledge. These

publications provide a detailed summary of major issues confronting fire managers and highlight current research results.

Friday Flash eNews updates highlight new publications, research topics, conferences, funding opportunities, and more. Subscribe to Friday Flash eNews from the firescience.gov home page.

# An Interagency Research, Development, and Applications Partnership



Learn more about the JFSP at:  
[www.firescience.gov](http://www.firescience.gov)  
(208) 387-5349  
National Interagency Fire Center  
3833 S. Development Ave.  
Boise, ID 83705-5354



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